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(58) Field of search

UK CL (Edition J) E1X, F2V
INT CL⁴ E03B, F16K
Derwent WPI, WPIL on-line

(54) Valve in or for a fluid flow system

(57) A valve in or for a fluid flow system comprises a first chamber (18), a second chamber (19), a drainage port (29) for the first chamber, the valve member (20) being selectively operable between a first condition, in which the first and second chambers are connected in fluid flow communication and the first chamber is disconnected from the drainage port (29) and a second condition, in which the first and second chambers are disconnected from fluid flow communication and the first chamber is connected in fluid flow communication with the drainage port (29). The valve member may be rotated by means of fluid flow direction indicator (27), may be locked at least in its second condition, and may be spherical, cylindrical, or frusto-conical. The valve is so positioned in the system that, when the valve member is in the second condition, fluid will drain from a meter.

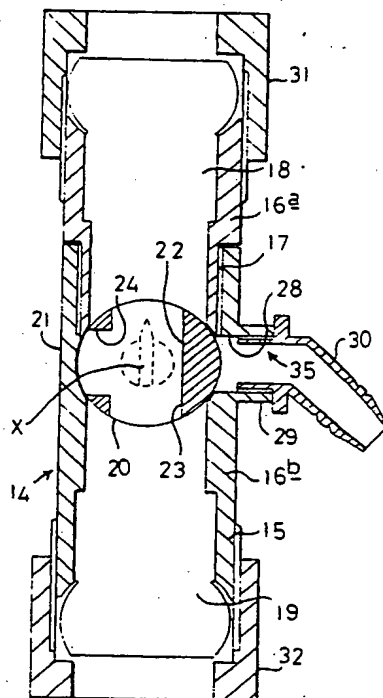
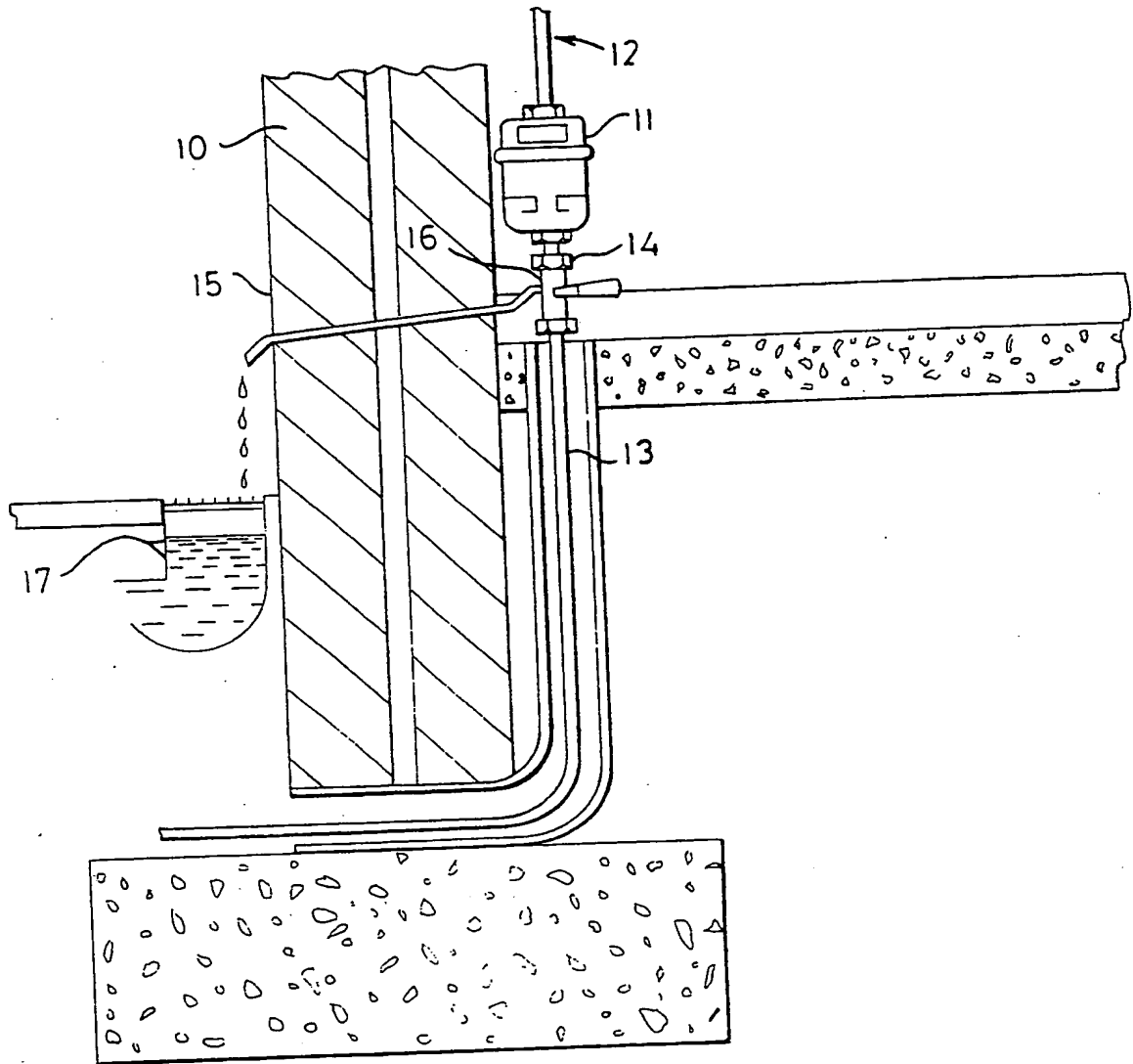


FIG 2

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FIG 1

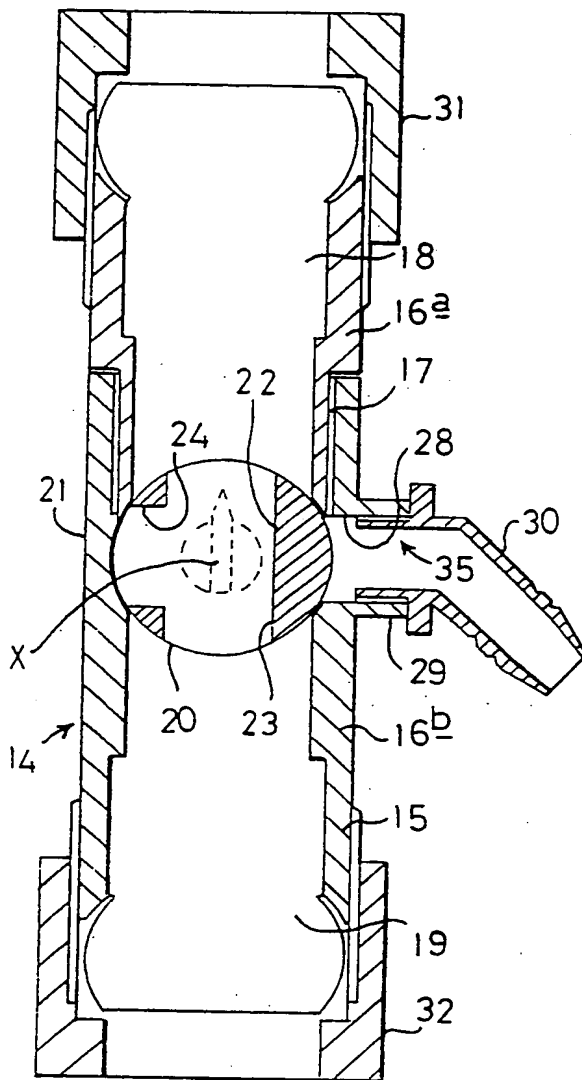


FIG 2

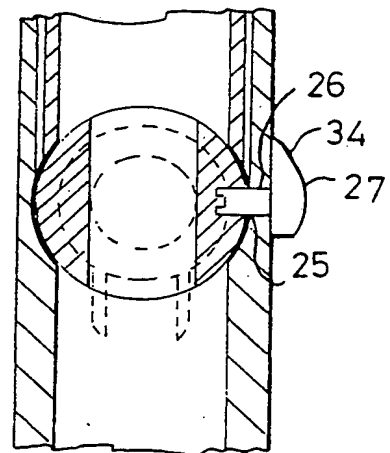


FIG 3



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PATENTS ACT 1977

JNL/MEP/A5672GB

Title: "Valve in or for a fluid flow system"

Description of Invention

This invention relates to a valve in or for a fluid flow system. The system may comprise, for example, an appliance, vessel, or a system or network of pipes.

It is frequently desirable in a fluid flow system that individual appliances, components, vessels or inter-connected pipework can be isolated either wholly or individually from a fluid supply and be drained, for example, for the purposes of maintenance or, particularly when the fluid is water, prevention of damage from sub-zero temperatures.

Moreover, it is desirable to provide a water consumption meter with a drainage facility which will allow isolation and drainage of the meter and/or the whole installation downstream of the meter. It has been proposed hitherto to provide such a drainage facility by fitting separate isolation stop valves and a drain point that need individual operation. Moreover, such currently known means make possible fraudulent access to water if installed before the meter whilst, if such drainage facility is provided after the meter, the meter is then vulnerable to frost damage because of the inability to drain the meter completely during periods of sub-zero temperature.

An object of the present invention is to provide a valve in or for a fluid flow system whereby the above mentioned disadvantages are overcome or are reduced.

According to the present invention we provide a valve in or for a fluid flow system comprising a first part, a second part, a drainage port for the first part, the valve being disposable between the first part and the second part and being selectively operable between a first condition, in which the first and second parts are connected in fluid flow communication and the first part is disconnected from the drainage port and a second condition, in which the first and second parts are disconnected from fluid flow communication and the first part is connected in fluid flow communication with the drainage port.

The second part may comprise a pipe part extending towards a fluid supply.

The first part may comprise a water consumption meter.

The valve may comprise a body having a first chamber adapted to be connected to the first part, a second chamber adapted to be connected to the second part, a third chamber adapted to be connected to the drainage port, a valve member movable in said body, the valve member having three intersecting passageways, the first and second passageways connecting the first and second chambers in communication and the third passageway being obturated by a part of the body when the valve member is in a first position and the first passageway and the third passageway connecting the first and third chambers in communication and the second passageway being obturated by a part of the body when the valve member is in a second position.

The valve member may be rotatable about an axis and the passageways may be radial or substantially radial to the axis.

The valve member may have a surface of revolution which is in sealing engagement with a seat part of the body.

The valve member may be spherical or cylindrical or frusto-conical.

The fluid flow system may be disposed so that the valve is positioned within a chamber provided below ground level and of a size to permit of access to the contents of the chamber for repair and/or maintenance.

The valve member may have an operating member disposed externally of the body and being connected to the valve member by the element which passes through a passage in a wall of the body.

The operating member may be lockable to lock the valve in at least one of said conditions and preferably in said second condition.

The operating member may be lockable by virtue of being connected to the body to prevent rotation of the valve member by means of a locking device.

The invention will now be described by way of example with reference to the accompanying drawings wherein:

FIGURE 1 is a diagrammatic illustration of a fluid flow system embodying the invention,

FIGURE 2 is a longitudinal cross-sectional view through the valve of Figure 1,

FIGURE 3 is a section on the line 3-3 of Figure 2, and

FIGURES 4 and 5 are views similar to that of Figures 2 and 3 but showing the valve in a different condition.

Referring to the drawings, Figure 1 shows a fluid flow system which in the present example is a conventional domestic water supply system. Figure 1 illustrates only part of the fluid flow system and the majority of the system

disposed within a house 10 is not illustrated but it will be understood to comprise of the usual components including a hot water supply system including a hot water cylinder and pipework leading from the hot water cylinder to sinks, baths, showers and the like with appropriate taps or the like, as well as a cold water system also extending to such sinks, baths, showers and the like and again provided with associated taps or the like, as well as cold water to supply to W.C.'s.

All these components, together with a water consumption meter 11 of conventional construction, comprise a first part 12 of the water flow system. A service pipe provides a second part 13 of the water flow system and extends towards a water supply such as a water mains. Disposed between the first and second parts 12, 13 is a valve 14 and, if desired, a permanent drainpipe 15 may extend from a drainage port 16 of the valve 14, through the wall 11 of the house so as to discharge adjacent a drain 17 of conventional form.

The valve 14 comprises a hollow body 15 comprising two elements 16a, 16b threadedly connected together as indicated at 17.

The element 16a provides a first or outlet chamber 18, whilst the element 16b provides a second or inlet chamber 19. Mounted for rotation within the body 15 is a valve member 20 of spherical configuration and in sealing engagement with a seat surface 21 of the body 15. It will be seen that the seat surface 21 is of part spherical configuration and to permit of the valve member 20 being engaged within the body 15, the valve member 20 is introduced into the body element 16b before threadedly engaging the body element 16a therewith.

The valve member 20 has a first passage 22 therein which extends radial to an axis of rotation X of the valve member 20, a second passage 23 which constitutes a continuation of the passage 22 and a third passage 24 which also extends radial to the axis 23 and perpendicular to the passages 22, 23. The passages 22, 23 extend diametrically through the valve member 20, whilst the passage 24 extends only to one side of the valve member 20. The valve member 20 has a projecting connecting rod 25 keyed thereto which passes through a passage 26 in the wall of the element 15 and is provided with an operating member 27 whereby the valve member 20 can be rotated from the position shown in Figures 2 and 3 through 90° to the position shown in Figures 4 and 5.

A third chamber 28 is provided in the element 15 by virtue of a radially extending passageway and boss 29 in which a drainage nozzle 30 is threadedly received. In the example illustrated the element 16a is connected to the first part 12 of the flow system by a conventional compression joint 31 whilst the element

16b is connected to the second part 13 by a similar compression joint 32. Of course, if desired, other forms of connection may be used, such as a solder connection.

The operating member 27 may be formed so as to be not easily manually rotated but formed with a recess such as a screwdriver slot 33 to deter unauthorised operation and may be provided with an indicating pointer 34 to indicate the direction of fluid flow. Alternatively the member 27 may be adapted to be conveniently operated by a hand of a user.

In use, when the valve member 20 is in a first position shown in Figure 1, the first and second chambers 18, 19 are connected in fluid flow communication, whilst the third chamber 28 is disconnected from fluid flow connection with either chamber. In this condition fluid can flow through the valve from the first part to the second part of the fluid flow system which are thereby connected in fluid flow communication.

By rotating the valve member 20 through 90° using the member 27, the valve member is moved to the position shown in Figures 4 and 5 in which fluid flow communication between the chambers 18, 19 is prevented and hence fluid flow communication between the first and second parts of the fluid flow system is prevented, whilst the first chamber 18, and hence the first part of the fluid flow system, is connected in fluid flow communication with the third chamber 28 and hence with the drainage port 35 at the end of the boss 29.

If desired, the valve member 20 may be of other configuration to that described hereinbefore, for example, it may be of cylindrical shape, the seat surface 21 being of corresponding shape and, if desired, O-Ring or other seals being provided between the cylindrical valve member and the body 15. The valve member would be provided with passageways as described hereinbefore and be rotated about its central longitudinal axis, all as described hereinbefore.

Further alternatively, the valve member may be frusto-conical, although otherwise as described hereinbefore.

If desired, the member 27 may be provided with means whereby it can be locked to the body 15 to prevent unauthorised rotation. For example, as shown in dotted line in Figure 5, by providing a pivoted lever 36 engageable with a hasp 37 through which a padlock 38 may be passed, at least when the valve member is in the second position shown in Figures 4 and 5. With the valve member disposed in the position shown in Figures 4 and 5 water from the supply is cut off from the interior of the house, whilst the first part 12 of the fluid flow system within the

house and meter 11 are connected to drain so that the meter 11 and the remainder of the first part 12 of the fluid flow system can be drained for maintenance and/or frost protection. The changeover from normal operation to drainage operation is simple and convenient, being carried out by manipulation of a single member. By providing means to lock the operating member 27 a facility is provided whereby the water supply to the first part of the fluid flow system can be prevented in the event, for example, of an occupier not paying his water bill.

A water meter and valve embodying the present invention may be disposed in a chamber in the ground of sufficient size to permit of access to the meter and/or valve for maintenance or repair and thus of sufficient size to provide access to authorised persons, whilst the above mentioned locking means prevents unauthorised re-connection of the water supply.

The features disclosed in the foregoing description, or the following claims, or the accompanying drawings, expressed in their specific forms or in terms of a means for performing the disclosed function, or a method or process for attaining the disclosed result, or a class or group of substances or compositions, as appropriate, may, separately or in any combination of such features, be utilised for realising the invention in diverse forms thereof.

CLAIMS:

1. A fluid flow system comprising a first part, a second part, a drainage port for the first part, a valve being disposed between the first part and the second part and being selectively operable between a first condition, in which the first and second parts are connected in fluid flow communication and the first part is disconnected from the drainage port and a second condition, in which the first and second parts are disconnected from fluid flow communication and the first part is connected in fluid flow communication with the drainage port.
2. A system according to Claim 1 wherein the second part comprises a pipe part extending towards a fluid supply.
3. A system according to Claim 1 or Claim 2 wherein the first part comprises a water consumption meter.
4. A system according to any one of the preceding claims wherein the valve comprises a body having a first chamber adapted to be connected to the first part, a second chamber adapted to be connected to the second part, a third chamber adapted to be connected to the drainage port, a valve member movable in said body, the valve member having three intersecting passageways, the first and second passageways connecting the first and second chambers in communication and the third passageway being obturated by a part of the body when the valve member is in a first position and the first passageway and the third passageway connecting the first and third chambers in communication and the second passageway being obturated by a part of the body when the valve member is in a second position.
5. A system according to Claim 4 wherein the valve member is rotatable about an axis and the passageways are radial or substantially radial to the axis.
6. A system according to Claim 4 or Claim 5 wherein the valve member has a surface of revolution which is in sealing engagement with a seat part of the body.

7. A system according to any one of Claims 4 to 6 wherein the valve member is spherical or cylindrical or frusto-conical.
8. A system according to any one of Claims 4 to 7 wherein the valve member has an operating member disposed externally of the body and is connected to the valve member by an element which passes through a passage in a wall of the body.
9. A system according to Claim 8 wherein the operating member is lockable to lock the valve in at least one of said conditions, preferably in said second condition.
10. A system according to Claim 9 wherein the operating member is lockable by virtue of being connected to the body to prevent rotation of the valve member by means of a locking device.
11. A system according to any one of the preceding claims wherein the valve is positioned within a chamber provided below ground level and of a size to permit of access to the contents of the chamber for repair and/or maintenance.
12. A fluid flow system substantially as hereinbefore described with reference to and as shown in the accompanying drawings.
13. A valve for a fluid flow system according to any one of the preceding claims.
14. A valve substantially as hereinbefore described with reference to and as shown in the accompanying drawings.
15. Any novel feature or novel combination of features described herein or shown in the accompanying drawings.

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